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Profile of Some Psychomotor Capacities in Top Performance Karate Do Athletes

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Abstract

The present paper aims at describing the way in which the manifestation of some psychomotor capacities can be correlated with the Karate Do athletes' competitive results. In our research we used the case study method, the observation method and the graphical representation method. We have applied the following tests: ACM (Attention Concentration and Mobility), CMR 1 (Complex Motor Reactivity 1) and VIGILANCE. Testing was performed at the UNEFS Psycho-Pedagogy Lab. We found that the tests administered to high performance athletes can provide an important database that can be subsequently used to establish a correlation between test results, the athletes' training and their competitive results.

Keywords: performance, karate do, psychomotor capacities.

1. Topic

By definition, sport is a methodical and systematic practice of both physical exercises and movement games, its goal being to reinforce the body, to develop will, courage, initiative, discipline and to enable performance achievement.

Karate concomitantly embodies sports and competition, by generating a challenge for the practitioners' mind, body and spirit, a challenge that will strengthen their character and help them overcome their fears. It is the challenge that will finally model the performer's life (Healy, 2008, p. 6).

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In karate do, the athlete's preparation is extremely complex, being more than a simple training process. The karate fighter's preparation includes all the components of the sports training process, namely technical preparation, tactical preparation, physical preparation, psychological preparation, theoretical preparation, but also moral and volitional preparation, all of them being in a permanent interdependence relationship.

In this contact sport, all the actions are developed in a continuous dynamics, with techniques performed sometimes at maximal parameters, to which we can add the unpredictable situations emerging from the full contact with the opponent and also the acute time pressure specific to each competitive fighting. That is why we consider that some capacities are crucially important to the karate athlete, and we refer here to motor capacities, as well as to the capacity to anticipate and reaction time, by means of which he can surprise and put his opponent in a position that is disadvantageous to the opponent, but favourable to the athlete himself. This is the clue that can make the difference, at the top performance level, between a world champion and a simple participant in a world championship.

The psychomotricity approach represents the perspective of a process seen from the inside by the subject involved, who must clearly perceive the individual's physical, motor and psychic aspects as a unit. According to Encyclopaedia Universalis, psychomotricity (1990) results from the integration of the motor and mental functions, under the effect of the nervous system, and is focused on the subject's relation to his own body (Dragnea and Bota, 1999, p. 47). Consequently, the motor and psychic dimensions mutually condition each other.

Epuran (2008, p. 216) groups the components of psychomotricity into four categories. Among the aptitudes that can be submitted to an improvement program and that will be differently expressed at the motor performance level, we can mention the psychomotor aptitudes which include: general coordination, segmental coordination, kinesthesis, corporal scheme, laterality, static and dynamic balance, reaction, repetition, anticipation and execution speed, spatial orientation and perception of one's own body movements, motor-perceptual coordination (perception of space and time - tempo, rhythm, perception of the duration - moving objects) and ideomotricity, along with the general motor aptitudes: speed, endurance, strength and mobility. The other three categories are represented by the self-assessment capacity, the confidence in one's personal capacities, the capacity to voluntarily adjust one's actions, the capacity to perform voluntary effort, perseverance, enduring pain etc.

The main phenomena incorporated in the sphere of psychomotricity are represented by: static, dynamic and motor-perceptual coordination – manifested at the level of all the osteomuscular system effectors; corporal scheme; ideomotricity – the conscious or unconscious reflection of the motor potential fixed in the corporal scheme and concretely manifested in the coordination system, motor intelligence represented by the exceptional ideomotricity manifestations, that can be considered the signs of superior motor intelligence – motor creativity; laterality – which reflects, on the motricity level, the functional asymmetry of the brain hemispheres and the movement rapidity (reaction speed included) that is influenced by the genetically conditioned temperamental particularities (http://www.scrigroup.com/educatie/psihologie-psihiatrie).

Thus, the programming and planning of the Karate Do athlete's actions rely on the psychic anticipation mechanism, which represents the spontaneous or the elaborated possibility to react before the emergence of some stimuli that create specific situations.

In top performance sports, we talk about precompetitive anticipation, which is submitted to the psychological laws of future prefiguring on the basis of past experiences, subjectively processed through personal filters consisting of cognitive attitudes, requirements, montages, routines, impressions (Epuran, Holdevici and Tonița, 2001, p. 263).

Some authors consider that in combat sports and in sports games, the more experienced athletes are, the more their anticipation capacities are developed, which may increase their anxiety, because they have a better concrete representation of the way a competition evolves.

According to Deliu (2008, p. 49), the prerequisites for a quick reaction in combat sports are represented by: a very good visual, acoustic, tactile and kinesthetic acuity, an optimal condition of the excitation, inhibition and cortical processes involved in the motor response, in general, an appropriate psychic background, physical fitness

close to the sports shape, optimism, confidence in one's personal capacities and a positive attitude toward the fighting that will take place.

The reaction time to the complex stimuli of the competitive fighting decreases in the Karate Do athletes concomitantly with the increase of their motor experience through specific training sessions, in inverse ratio to their specific technical-tactical improvement; the more athletes have practiced and applied, in their training lessons and competitive fighting, these technical-tactical responses to the respective specific stimuli, the more their motor reaction latency time decreases (Deliu, 2001, p. 64).

Consequently, by having in view the above-mentioned aspects, the present paper aims at arguing the modality in which the manifestation of some psychomotor capacities can be correlated with the Karate Do athletes' competitive results.

2. Purpose and hypotheses

Our objective is to make a comparison between the Karate Do athletes' competitive results and the manifestation of some selected psychomotor capacities.

We assume that top Karate Do athletes' achieve high levels of psychomotor capacities.

3. Material and methods

The methods used by us are: the case study method, the observation method and the graphical representation method.

Our subjects are top performance athletes from the "Rapid" Sports Club of Bucharest, components of the WKC (World Karate Confederation) RKF National Karate Squad.

In order to develop our research, we administered the following tests from the PSISELTEVA computerized battery created by RQ-Plus: ACM (Attention Concentration and Mobility), CMR 1 (Complex Motor Reactivity 1) and VIGILANCE. Testing was performed within the UNEFS Psycho-Pedagogy Lab, under the supervision of Assistant Lecturer Radu Predoiu, Doctor of Psychology.

The ACM test is conceived as a dynamic pattern made up of sequences – tasks with progressive degrees of difficulty. Each sequence presents a number of triangles inscribed into four rectangles. The test consists in the emission of pre-established responses and takes place within an imposed time frame. In the test construction, we had in view to create conditions close to the exertions of working activity, through: the situation dynamics, the progressive increase of the degree of difficulty, the spatial signal localization, the establishment of an accurate action way and the test development within an imposed time frame. The test is focused on aspects related to the attention concentration and mobility. ACM also provides information about some aspects related to the learning capacity, the spirit of observation, the capacity of visual discrimination, the perception speed and the visual-manual coordination.

The CMR 1 test is conceived as a dynamic pattern made up of 38 sequences issued from the combination of maximum 3 signal-stimuli located in the centre and a signal-stimulus with a peripheral location, and it consists in the emission of pre-established responses to each signal-stimulus of a sequence. In the test construction, we had in view to create problem situations such as: the randomized (as time, number, spatial localization) generation of stimuli within a sequence, the generation of stimuli at certain time intervals – peripheral signal, the test development within an imposed time frame (slowly, rapidly) and out of the imposed time frame, by also taking into account the unpredictable situations. The test involves aspects such as: the correct and judicious information processing, memory, unisegmental, bisegmental and multisegmental coordination, motor accuracy, the prompt selection of the response modalities, the capacity to use feedback-provided information, the execution speed adjustment to the dynamics imposed by the stimuli appearance, the optimal dosage of the inhibitory process, mobility, functional plasticity, the correct estimation of the useful action time, operativeness, self-control,

sustained attention, emotional balance under the time pressure conditions and tolerance to frustration. At the same time, the test involves an emotional load and a perturbing tension created by the risk exposure (need for a rapid and correct work at an imposed quick pace), the actions performed under the time pressure, the dynamic development of situations and the conflicting state generated by the order "Find a way to act quickly and correctly!"

The Vigilance test is conceived as a dynamic pattern made up of 100 sequences that present at random a significant visual stimulus or a non-significant visual stimulus. The response modality is pre-established. The test is developed within an imposed time frame. In the test construction, we had in view to create the following problem situations: the generation of visual stimuli having almost similar significances, forms, designs and the unpredictable generation of the signal-stimulus. This test also involves the discrimination and the identification in due time of the visual-signal stimulus, an optimal dosage of the excitation and inhibition processes, visual memory, promptness, sustained attention and self-control.

4. Results

Results were tabulated and graphically represented as follows:

Table 1. Competitive results 2011-2012

No.	Surname and name	National Championship		World Championship	European Championship
		2011	2012	2011	2012
1.	A.G.	1st place	1st place	No participation	No participation
2.	B.D.C.	2nd place	3rd place	No participation	No participation
3.	B.F.	1st place	1st place	No podium place	1st place
4.	I.V.R.	1st place	1st place	No participation	1st place
5.	L.E.A.	1st place	1st place	1st place	1st place
6.	L.I.S.	3rd place	1st place	1st place	1st place
7.	S.D.M.	1st place	1st place	No participation	3rd place

In Table 1 we present the competitive results achieved by athletes in 2011 and 2012, both at national and international level, with a focus on the National Championship, the World Championship and the European Championship, according to the WKC (World Karate Confederation) RKF official site (http://www.wukf.ro) and to the WUFK site (http://www.wukf-karate.org). The table interpretation shows that our subjects are top athletes with outstanding results in the big competitions, who have been constant in time in their sports activity. As we can see, in the National Championship all the athletes reached the top places in 2011 and 2012. On the international level, in 2011, three athletes participated in the World Championship held in Italy (Lignano), between 25 and 27 May; only one of them failed to get one of the top three places, while the other two ranked 1st. Among the seven athletes tested, four could not take part in this competition, because their age did not fit the junior category, which is 18 to 21 years old. In 2012, five out of the seven athletes tested by us participated in the European Championship held in Scotland (Glasgow), between 31 May and 3 June, 2012. All of them reached the podium, four being ranked 1st and one being ranked 3rd, which was due to the fact that he was participating for the first time in a senior competition, where the fight is more strenuous by far. The other two athletes did not take part in the respective championship because, although they had good results on the national level, they were not selected in the national senior squad for the European Championship.

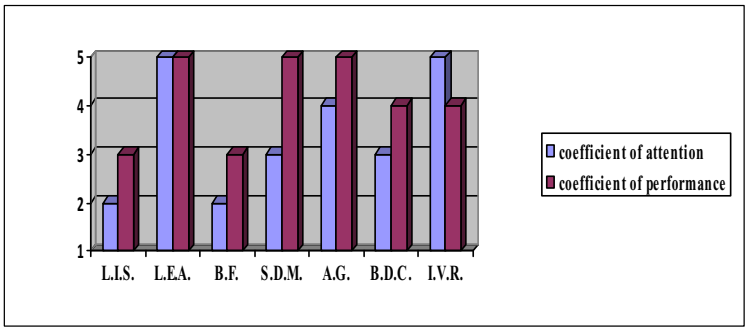

Figure 1. ACM test

The ACM test results were directly processed by the PSISELTEVA battery software and were displayed under the form of coefficients, namely the coefficient of attention and the coefficient of performance. The software also provided the ciphered data corresponding to the value classes from 1 to 5, where 1 stands for the poorest class and 5 stands for the best class. In relation to the coefficient of performance, all the athletes are above the mean (Figure 1), if we consider that class 3 represents the mean level. Among them, three athletes (L.E.A., A.G. and S.D.M.) have very good results in class 5, which is positively reflected by their competitive activity in 2011/2012, on both the national and international levels. As to the coefficient of attention, the results achieved by the athletes B.F. and L.I.S. position them in a lower class. However, their competitive results on the national and international levels were not affected, both of them getting one of the top three positions, due to their rich competitive experience and optimum sports shape. The other athletes' results ranked them above the mean, and we can mention the athletes I.V.R. and L.E.A., who were positioned in the best class (5).

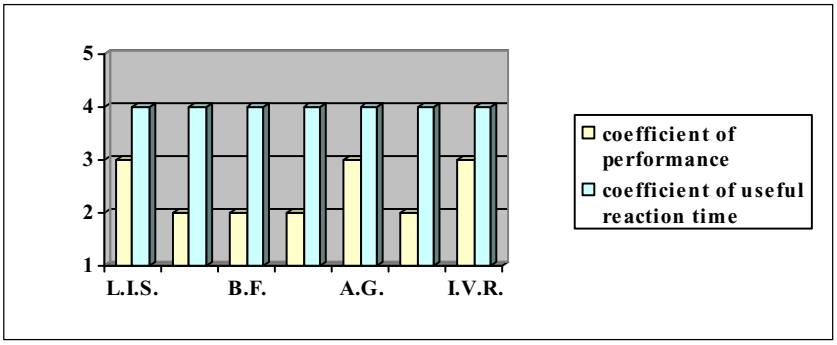

Figure 2. CMR 1 test

The RCM 1 test results were directly processed by the PSISELTEVA battery software and were displayed under the form of coefficients, namely: learning capacity, coefficient of operative memory, coefficient of motor-perceptual efficiency, coefficient of performance, coefficient of useful reaction time (msec), coefficient of resistance to perturbing factors, coefficient of personal rhythm, pressure-time coefficient, coefficient of perceptual field inspection and tempo. The software also provided the ciphered data corresponding to the value classes from 1 to 5, where 1 stands for the poorest class and 5 stands for the best class. Among these coefficients, we approached the coefficient of useful reaction time and the coefficient of performance, because we consider that they are the most important to the competitive activity in karate do. In relation to the coefficient of reaction time, none of the athletes tested reached the necessary score to accede to class 5, so they were all positioned in

class 4 (Figure 2). As to the coefficient of performance, their results are even lower, most of them corresponding to the mean classes, namely 2 and 3.

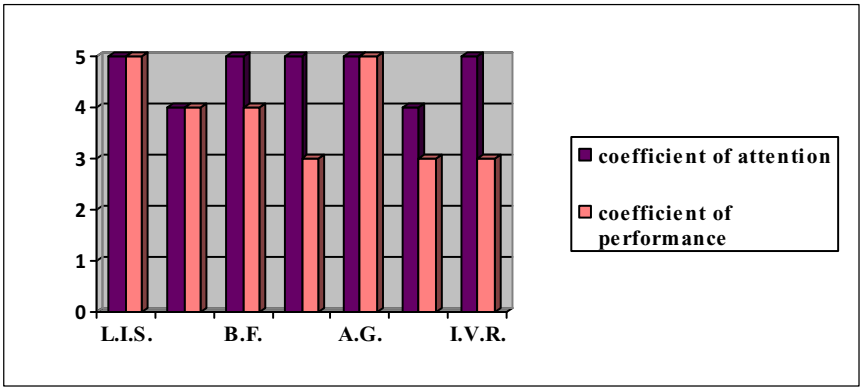

Figure 3. Vigilance test

The Vigilance test results were directly processed by the PSISELTEVA battery software and were displayed under the form of coefficients, namely: coefficient of attention efficiency, coefficient of performance, RT discrimination and vigilance. The software also provided the ciphered data corresponding to the value classes from 1 to 5, where 1 stands for the poorest class and 5 stands for the best class. Among these coefficients, we approached the coefficient of attention efficiency and the coefficient of performance, because we consider that they are extremely important to the competitive activity in karate do. According to the graphical interpretation (Figure 3), all the athletes tested achieved very good results, with five athletes (L.I.S., B.F., S.D.M., A.G. and I.V.R.) positioned in class 5, due to their score for the coefficient of attention, but also with good results for the coefficient of performance.

5. Discussion

The ACM test results show that our athletes are positioned in the mean and superior classes, which indicates that they have a very good spirit of observation, a very well developed perception speed and very good visual-manual coordination, aspects that can be correlated with their training and competitive activities.

In the CMR 1 test, our athletes' results position them in the same mean and superior classes, which indicates that aspects such as: the correct and judicious information processing, memory, coordination, the prompt selection of the response modalities, the capacity to use feedback-provided information, mobility, functional plasticity, emotional balance under the time pressure conditions and tolerance to frustration are very well developed and controlled by our athletes both in training sessions and in competitions.

Concerning the Vigilance test, our athletes' results position them in the superior classes, which indicates that they can identify in due time the visual-signal stimulus that can be represented by the opponent's attack during a training session or a competition, by a very well developed capacity of attention and self-control.

Consequently, after the administration of the lab tests considered by us to be important to the manifestation of these psychomotor capacities, we found out that our subjects are elite athletes with outstanding results in the big competitions, components of the national Karate Do squad, who have been constant in their sports activity, which is reflected by the very good results they obtained in our tests.

6. Conclusions

We found that tests can provide an important database that can be subsequently used to make a correlation between the test results, the training of top performance athletes and their competitive results. The programming and planning of the Karate Do athlete's actions rely on the psychic anticipation mechanism, which represents the spontaneous or the elaborated possibility to react before the emergence of some stimuli that create specific situations, especially in karate do, a heuristic sport with combative opponents eager to impose their supremacy, where the actions are very quickly performed under the time pressure.

We can state that all the athletes tested have a good and very good level of attention concentration and mobility, a complex motor reactivity that goes from above the mean level to the very good level and also a high vigilance and self-control capacity.

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